Class Today

• Learning about interactive programs
• Events
  – Pressing a key
  – Clicking on objects
  – Picking one object to move with arrow keys

Control of Flow

• Control of flow – how the sequence of actions in a program is controlled
  – What action happens first, second, third, ….  
• In movie-style programs, the sequence of actions is determined by the programmer
  – Creating a storyboard design
  – Writing program methods to carry out the designed sequence

Interactive Animations

• In interactive programs, the sequence of actions is determined at runtime, when the user provides input
  – Clicks the mouse
  – Presses a key on the keyboard
  – Other sources of input are possible
• Interactive games
  – Each time the program runs, user input may cause a different sequence of actions
Event Listeners

- An **event** may
  - Trigger a response, or
  - Move objects into positions that create some condition (e.g. a collision) that triggers a response
- An **event listener** is a *procedure* that is called to carry out the response.
- When an event is linked to an event listener, a **behavior** is created.
- How does this effect your program?
  - Input from the user (**events**)
  - How objects respond to events (**event listener**)

Setup for this example

- Madhatter (Randy), Queen, BoxTruck, objectMarker (to position direction to face)

How does an Alice world know where to start

- There is an event listener
- When the program starts a scene is activated, and myFirstMethod code executes

Example 1: Want Randy to turn around when we press the “t” key

- Add an event listener:
  - Keyboard, addKeyPressListener
Press “t” and Randy spins

- Must use if to determine if “t” has been pressed, and then what to do if it has

Mouse Clicks

- Interactive programs – allow user to mouse click an object
  - Buttons in an interface
  - Targets in a game
  - Checklist of items on a form
- Will see how to pass information about a mouse clicked object to an event listener

Example 2: Click on Randy to get him to move into the car

- Add MouseClickOnObjectListener

You can limit who you can click on for this code

- We want it to work for Randy and Queen

You can refer to the object you click on
Now Limited to Randy and Queen

• Shown here

Now use the object you click on as an object that can do things

• Can choose it:

Code to put the object in the truck

Try it out

• Place Queen and Randy on either side of truck – click on queen, then Randy
Drive the boxTruck with arrow keys

- Add an objectMoverEvent
- Set it to move the boxTruck with the arrow keys

Event Storyboard

- How do you create a storyboard when you don’t know what the story will be? It could be different every time you run it.

How do we add in instructions?

An image

Instructions:

- Click on a person and they will get in the truck
- Press T for the madHatter to turn around
- Use arrow keys to move the truck (but first put the two people in the truck)
- Click on this picture to make it disappear

This lecture covered

- Creating three types of events
  - Pressing a key
  - Clicking on an object or a set of objects
  - Moving an object with arrow keys
- Handling the events with event listeners